















Potential % of overall UK	Celectricity supply in 2050
Onshore wind	8-11%
Offshore wind	18-23%
Wave/Tidal	12-14%
Biomass	9-11%
PV solar	6-8%
TOTAL	<u>53-67%</u>
Based on overall likely level of su	oply of 400-500 TWh in 2050









# Large scale technologies-Some need to be at that scale to get optimal efficiency and to get access to large resources e.g offshore

But it can be done wrong- e.g the Severn Barrage is arguably too big, too invasive and too inflexible

The risk is the dominance yet again of large powerful corporate interests.

There is a need for lobbying to speed the process up and make sure it is done right





### Zero Carbon Dwellings

Under the new Code for Sustainable Housing by 2016 all new houses must be zero net carbon

\* Designed to use minimal energy and

\* to get any residual energy required from renewable energy or low carbon sources on site.

The energy supply systems must built into the house or in it's grounds or immediately in the vicinity.

NO IMPORTED POWER It's specified that 'Off-site renewable contributions can only be used where these are directly supplied to the dwellings by private wire arrangement' i.e directly from local sources.

### Zero Carbon Houses

On Site Autonomy:

NO LONG-DISTANCE ENERGY IMPORTS ALLOWED

'We won't allow offsetting with a wind turbine in Cornwall; we want to promote real energy innovation at the local level'.

Yvette Cooper, Prospect magazine Nov 2007

'Councils need to continue to set Merton rules on the proportion of renewable energy supplied directly to developments from local sources. An offshore wind farm would not count'.

Yvette Cooper, Guardian 7/12/07









Micro-generation		
No. Installations		m 1 11
Micro-wind	650	
Micro-hydro	90	
Ground source heat pumps	546	The second
Biomass boilers (pellets)	150	6
Solar water heating	78,470	Cutty Jugy
Solar PV	1,301	
Micro-CHP	990	
Fuel Cells	5	
Total	82,202	









*The energy available from the wind is the square of the blade diameter.* 

So a machine with blade diameter ten times that of a micro device, can generate 100 times more power than the micro device - 10 times more than 10 micro devices.

The energy in the wind is also the cube of the wind speed.

Larger machines are likely to be in much winder areas. Just doubling the wind speed from 4m/s (good inner city site) to 8m/s (good elevated rural site) would yield over 40 times more potential energy output.



# Micro wind in the city

'In many urban areas they are unlikely to pay back either their carbon emissions or the home owner's costs for installation and maintenance'.

Building Research Establishment Dec 2007













#### Woking Borough Council

Savings from energy efficiency invested in PV solar, mini-CHP and a fuel cell, all linked by a private wire electricity grid and by a district heating network



200kWe fuel cell and 532kWpeak of PV solar

Net savings of 77% of carbon emissions

since 1990

Result:

#### Woking: off-electricity grid:

Higher efficiency, cheaper power

Opting out of the national grid avoids:

- \* Paying utility suppliers costs, including transmission costs
- \* Contributing to their profits
- But that also means you avoid paying the:
- \* The Renewables Obligation charge
- \* Climate Change Levy
- \* Costs associated with the development of the transmission and distribution system

So you are free riding- avoiding charges that all other consumers pay

Woking is not autonomous- it is still linked to the gas grid, for the CHP and fuel cell

#### London Energy Plan for 2010

7,000 domestic solar photovoltaic installations

250 photovoltaic applications on commercial and public buildings Six large wind turbines

500 small wind generators on public or private buildings 25,000 domestic solar water heating schemes

2,000 solar water heating schemes for swimming pools

Plus anaerobic digestion plants with energy recovery Biomass-fuelled combined ht and power plants.

According to the strategy document, "these capacities should then be at least tripled by 2020".

#### Limits to autonomy

The Climate Change Action Plan produced by Mayor of London Ken Livingstone set a target to move a quarter of London's energy supply off the National Grid and on to more efficient, local energy systems by 2025.

"We cannot switch all our energy over to renewable energy just yet, as the renewable energy produced today cannot meet all of London's energy demand' London Strategy Document.

An earlier proposal included an overall target of obtaining 14% of London's electricity from renewables by 2010, 4% from internal sources, the rest being imported. (Mayors Energy Strategy, 2004).







## COMMUNITY TECHNOLOGY



Locally owned wind project in Wales

### LOCAL OWNERSHIP

The UK gets around 1% of its electricity from wind -98% of wind farms are owned by large companies in the UK.

#### Denmark gets 21% of its electricity from wind- over 80% of the turbines are locally owned by wind co-ops or local farmers

There are many less objections... It's the same for Germany- 50% are locally owned. RENEWABLES OBLIGATION

RENEWABLES OBLIGATION makes it hard for co-ops to set up projects- only two so far in UK Many UK national opinion polls have found that wind energy is a very popular option – typically 80% support it. But there are local objections to some projects- they may be seen as being *imposed* on communities. Local ownership means less local opposition- more support



# Local Ownership of wind projects

Ownership of Orshore wind power in UK, Germany, Denmark and The Netherlands by Per Cent Capacity in 2004						
Type of owner	UK	Germany	Denmark	Netherlands		
Utilities/ corporate	98	55	12	60		
Famers	1	35	63	34		
Сооря	0.4	10	25	6		

## COMMUNITY SCALE

BIG ENOUGH TO BE TECHNOLOGICALLY AND ECONOMICALLY EFFICIENT

SMALL ENOUGH TO BE LOCALLY OWNED OR CONTROLLED

and local projects can help in local economic and social regeneration

## POSSIBLE SOURCES OF ACTION

Transition Town movement Green Community movement Local Energy Advice Centres Community Groups Support Networks

Lots of ideas and enthusiasm...



On the ground

CAT, Energy 21, AAT, Hockerton, NATTA and many others all do their bit.

....and there are some wonderful exemplars from abroad like the Samsoe project ..







